

### **'Chase', A Multiple Disease Resistant Pinto Dry Edible Bean**

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Rust and bacterial (mainly common blight) diseases have reduced Pinto dry bean yields and seed quality in southwest Nebraska in recent years. The Nebraska Dry Bean Growers Association requested us to release a Pinto variety with resistance to rust and bacterial diseases. The NE-Pinto breeding line NE-PWM<sub>2</sub>-89-5 was developed with resistance to the pathogens causing the above diseases and was approved for release as Pinto 'Chase' (named after a county in southwest Nebraska where Pinto dry beans are mainly grown) in Spring 1993.

'Chase' was derived from two cycles of intercrosses of lines from the crosses of the parents GN Nebr. #1 sel. 27 (source, D. Coyne, NE; late maturing, common blight, halo blight, and brown spot resistance), 'Tacaragua' (source, Nicolas E. Valladares-Sanchez, Venezuela and D. Coyne, NE; resistant to rust [Ur<sub>3</sub> gene], avoidance of white mold due to upright and porous plant architecture, late maturing), and Pinto 'UI-111' (early maturity). Pedigree selection was used to advance the line to homozygosity.

Separate inoculated common blight and rust nurseries were grown at North Platte, NE, white mold nurseries (under conditions promoting white mold) and nondisease nurseries at Mitchell and Scottsbluff, NE, respectively. All of these replicated experiments (RCRD) were grown under irrigated conditions. 'Chase', along with standard varieties Pinto 'UI-114' and 'Othello', were included in the above experiments (1989-1992) as well as in the on-farm trials (nonreplicated) conducted by David Nuland in 1992 (*The Bean Bag*, Winter, 1992, p. 12, published by the Nebraska Dry Bean Growers Association, 4502 Avenue I, Scottsbluff, NE 69361). Disease ratings of entries were recorded in the inoculated as well as in naturally infected nurseries. Other data recorded were yields (except in the rust and common blight inoculated nurseries at North Platte), days to maturity, seed weights (no./lb. or 100 seed weight in grams), seed coat cracking (Dickson's Dropping method), and times to cook ('Mattson' cooker method).

'Chase' was resistant to the prevailing rust races in Nebraska (1989-1992) and also expressed slightly more leaf resistance to common blight than 'Othello' and 'UI-114'. 'Chase' was also observed to have high resistance to halo blight and brown spot disease in naturally infected nurseries (source, D. Nuland). 'Chase' exhibited slightly less root rot damage than 'Othello' and UI-114 in two nurseries (1991, 1992) (source, D. Nuland). The % white mold infection of 'Chase' and 'Othello' were about similar but 'UI-114' was more susceptible to white mold than the above entries. 'Chase' is susceptible to BCMV NY-15 strain (source, J. Myers, ID, and M. Silbernagel, ARS, WA). This is the first Pinto with resistance to so many different pathogens.

Under nondisease conditions, the yields of 'Chase' were similar to 'Othello' and generally exceeded Pinto 'UI-114'. However, under rust and bacterial blight conditions (as in 1992), the yields of 'Chase' exceeded

those of 'Othello' and UI-114. The analysis of the data from the 15 trials in different locations in NE and CO showed that 'Chase' yielded more than 'UI-114' 86% of the time and 'Othello' 80% of the time (source, D. Nuland). The overall mean yield of 'Chase' exceeded 'Othello' in the midwest regional nurseries in 1992 (data compiled by K. Grafton, ND). 'Chase' generally matured several days later than the above entries. The plant height and spread of the entries were similar in two nurseries in 1992. The seed quality traits (seed coat cracking, time to cook) of 'Chase' and 'UI-111' ('UI-114' not included in those tests) were nearly similar. The visual appearance of canned samples of 'Chase' and 'Othello' were nearly similar (D. Smith, Dept. of Food Science and Technology, UNL, NE, personal communication).

Foundation seed of 'Chase' was produced in California and in Nebraska in 1992. Small samples for trial may be obtained from Ron Helsing, Manager, NFSD, Agronomy Department, UNL, Lincoln, NE 68583. Plant Variety Protection of 'Chase' is being considered.